

CLAIMS

1. An apparatus for detecting an ear disorder, the apparatus including:
means for transmitting and receiving a plurality of signals to interact with
an ear for ear disorder detection;
means for directing the plurality of signals along a plurality of different
5 directions to interact with different ear portions; and
means for determining which received signal provides an accurate
indication of the detected ear disorder.
2. An apparatus as set forth in claim 1, wherein the means for transmitting
includes a plurality of transducers.
3. An apparatus as set forth in claim 1, wherein the means for transmitting
includes at least one transducer.
4. An apparatus as set forth in claim 1, wherein the means for directing
includes means for targeting the signals toward different ear portions.
5. An apparatus for detecting an ear disorder, the apparatus including:
a plurality of transducers, each transducer being operable to transmit
and receive a signal for ear disorder detection;
means for supporting the transducers in an array to interact with an ear,
5 with each transducer being oriented along a different direction for interacting
with a different ear portion during operation; and

means for determining which of the transducers is operable to provide an accurate indication of the detected ear disorder.

6. An apparatus as set forth in claim 5, wherein the means for supporting includes means for supporting in a curved array.

7. An apparatus as set forth in claim 5, wherein the means for determining includes means for determining which transducer is directed at a certain ear portion.

8. An apparatus as set forth in claim 5, including means for controlling the transducers to operate sequentially.

9. An apparatus as set forth in claim 8, wherein the means for controlling and the means for determining operate cooperatively such that each transducer is operated to transceive the associated signal without conflict from other signals.

10. An apparatus as set forth in claim 5, wherein the transducers are ultrasound transducers and the associated signal is an ultrasonic signal that is reflected from the respective ear portion, and the means for determining includes means for determining if the associated signal has reflected from a portion of an ear drum of the ear.

11. An apparatus as set forth in claim 10, including means for determining characteristics of a second echo from a middle ear of the ear.

12. An apparatus as set forth in claim 5, including means for using only the signal from only one transducer determined to provide an accurate indication for the ear disorder detection.

13. An apparatus as set forth in claim 5, wherein the transducer determined to be operable to provide an accurate indication of the detected ear disorder receives a signal transmitted from another transducer to provide the accurate indication.

14. An apparatus for detecting an ear disorder, the apparatus including:
a plurality of transducers, each transducer being operable to transceive a signal for ear disorder detection;

5 means for supporting the transducers in an array to interact with an ear, with each transducer being oriented along a different direction for interacting with a different ear portion during operation; and

means for controlling the transducers to operate sequentially.

15. An apparatus as set forth in claim 14, wherein the means for supporting includes means for supporting in a curved array.

16. An apparatus as set forth in claim 14, including means for determining which of the transducers is operable to provide an accurate indication of the detected ear disorder.

17. An apparatus as set forth in claim 16, wherein the means for determining which of the transducers is operable to provide an accurate indication of the detected ear disorder includes means for determining which transducer has received a signal transmitted from another transducer that is usable to provide an accurate indication of the detected ear disorder.

18. An apparatus as set forth in claim 16, wherein the means for determining includes means for determining which transducer is directed at a certain ear portion.

19. An apparatus as set forth in claim 16, wherein the means for controlling and the means for determining operate cooperatively such that each transducer is operated to transceive the associated signal without conflict from other signals.

20. An apparatus as set forth in claim 16, wherein the transducers are ultrasound transducers and the associated signal is an ultrasonic signal that is reflected from the respective ear portion, and the means for determining includes means for determining if the associated signal has reflected from a portion of an ear drum of the ear.

21. An apparatus as set forth in claim 20, including means for determining characteristics of a second echo from a middle ear of the ear.

22. An apparatus as set forth in claim 16, including means for using only the signal from only one transducer determined to provide an accurate indication for the ear disorder detection.

23. An apparatus for detecting an ear disorder, the apparatus including:
a plurality of transducers, each transducer being operable to transceive a signal for ear disorder detection; and
means for supporting the transducers in a curved array.

24. An apparatus as set forth in claim 23, including means for controlling the transducers to operate sequentially.

25. An apparatus as set forth in claim 23, including means for determining which of the transducers is operable to provide an accurate indication of the detected ear disorder.

26. An apparatus as set forth in claim 25, wherein the means for determining which of the transducers is operable to provide an accurate indication of the detected ear disorder includes means for determining which transducer has received a signal transmitted from another transducer that is usable to provide an accurate indication of the detected ear disorder.

27. An apparatus as set forth in claim 25, wherein the means for determining includes means for determining which transducer is directed at a certain ear portion.

28. An apparatus as set forth in claim 25, wherein the transducers are ultrasound transducers and the associated signal is an ultrasonic signal that is reflected from the respective ear portion, and the means for determining includes means for determining if the associated signal has reflected from a portion of an ear drum of the ear.

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29. An apparatus as set forth in claim 28, including means for determining characteristics of a second echo from a middle ear of the ear.

30. An apparatus as set forth in claim 25, including means for using only the signal from only one transducer determined to provide an accurate indication for the ear disorder detection.

31. A method of detecting an ear disorder, the method including:
transmitting and receiving a plurality of signals to interact with an ear for ear disorder detection;

directing the plurality of signals along a plurality of different directions to interact with different ear portions; and

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determining which received signal provides an accurate indication of the detected ear disorder.

32. A method as set forth in claim 31, wherein the step of transmitting includes transmitting from a plurality of transducers.

33. A method as set forth in claim 31, wherein the step of transmitting includes transmitting from at least one transducer.

34. A method as set forth in claim 31, wherein the step of directing includes targeting the signals toward different ear portions.

35. A method of detecting an ear disorder, the method including:
providing a probe that includes a plurality of transducers;
interacting the probe with an ear;
operating the plurality of transducers to provide information; and
determining the existence of an ear disorder using the information.

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36. A method as set forth in claim 35, wherein the step of determining includes using information derived from less than all of the transducers.

37. A method as set forth in claim 36, wherein the step of determining includes using information derived from only one transducer.

38. A method as set forth in claim 35, wherein the step of providing a probe includes orienting each transducer along a different direction for interaction with a different ear portion during operation.

39. A method as set forth in claim 35, wherein the step of providing a probe includes supporting the transducers in a curved array.

40. A method as set forth in claim 35, wherein the step of determining includes determining which of the transducers is operable to provide an accurate indication of the detected ear disorder.

41. A method as set forth in claim 40, wherein the step of determining which of the transducers is operable to provide an accurate indication of the detected ear disorder includes determining which transducer has received a signal transmitted from another transducer that is usable to provide an accurate indication of the detected ear disorder.

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42. A method as set forth in claim 35, wherein the step of determining includes determining which transducer is directed at a certain ear portion.

43. A method of detecting an ear disorder, the method including:
providing a probe that includes a plurality of transducers arranged in a curved array;
interacting the probe with an ear; and

5 determining the existence of an ear disorder.

44. A method as set forth in claim 43, wherein the step of determining includes using information derived from less than all of the transducers.

45. A method as set forth in claim 44, wherein the step of determining includes using information derived from only one transducer.

46. A method as set forth in claim 43, wherein the step of determining includes determining which of the transducers is operable to provide an accurate indication of the detected ear disorder.

47. A method as set forth in claim 46, wherein the step of determining which of the transducers is operable to provide an accurate indication of the detected ear disorder includes determining which transducer has received a signal transmitted from another transducer that is usable to provide an accurate
5 indication of the detected ear disorder.

48. A method as set forth in claim 43, wherein the step of determining includes determining which transducer is directed at a certain ear portion.